DOCUMENT RESUME

ED 147 826 CS 203 778

AUTHOR Brown, Gerald R.
TITLE Handwriting: A State of the Art Research Paper.
INSTITUTION Winnipeg School Div. Number 1, Manitoba (Canada).
PUB DATE Sep 77
NOTE 53p.; Prepared for the Superintendent's Department, Winnipeg School Division No. 1
AVAILABLE FROM The Winnipeg School Division No. 1, Teachers' Library and Resource Centre, 436 William Avenue, Winnipeg, R3A 0J4 Manitoba, Canada ($6.00)

EDRS PRICE MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS *Curriculum Development; Elementary Education; *Handwriting; *Handwriting Development; *Handwriting Instruction; Handwriting Readiness; Handwriting Skills; Lateral Dominance; Left Handed Writer; *State of the Art Reviews; *Teaching Techniques

ABSTRACT

This paper investigates the state of the art of handwriting and lists 11 recommendations that were made to improve handwriting instruction in one public school system's language arts curriculum. The following topics are discussed: historical perspectives of the art of handwriting, the nature of handwriting instruction, methods and approaches to instruction (theories of learning, readiness and preparation for writing, styles of penmanship, extent of time for instruction and practice, teaching techniques and procedures, and components of legibility), handedness (sinistral, dextral, or ambidextrous), special learning disabilities, the evaluation process and its implications, and preparation and training of teachers. A bibliography is included. (RL)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED147826

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Handwriting

A State of the Art Research Paper

Prepared for the

Superintendent's Department

Winnipeg School Division No.1

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY
Winnipeg School Division No. 1
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

by

Gerald R Brown
Consultant

Reference & Resource Services
Teachers' Library & Resource Centre

Winnipeg, Manitoba

September, 1977

CS203778

Table of Contents

Introduction

I Historical Perspectives on the Art

II Nature of Handwriting Instruction

III Methods and Approaches to Instruction

- A. Theories of Learning
- B. Readiness and Preparation for Writing
- C. Styles of Penmanship
- D. Extent of Time for Instruction and Practice
- E. Teaching Techniques and Procedures
- F. Components of Legibility

IV Handedness: Sinistral, Dextral or Ambidextrous

V Special Learning Disabilities

VI Evaluation: The Process and Its Implications

- A. Diagnosis
- B. Scales and Measurements
- C. Remediation
- D. Grading, and Influence on Marks
- E. Standards

VII Teacher Preperation and Training

VIII Summary

IX Recommendations

X Bibliography for Footnotes

Introduction

As a tool of communication, handwriting is a means for recording and conveying thoughts: the emphasis is upon what a pupil writes. In handwriting or penmanship instruction, however, the emphasis is necessarily upon how a person writes: the main concern is the legibility and efficient production of written symbols. In itself it doesn't influence the quality or validity of what is written; muddy thoughts and insipid ideas are no better for being written legibly. It is important, however, that we develop skill in handwriting to the point where the very process of writing itself does not detract from the thinking that needs to accompany intelligent communication. The how and what of handwriting are in phase when pupils' writing is sufficiently rapid and legible to meet their needs in all instructional areas. Similarly, it is important that facility in handwriting be developed to the point where the "thought-getting" process of the reader is not interrupted by the problem of deciphering the symbols which have been transcribed.

The purpose of this research paper is to investigate the state of the art of handwriting and for penmanship in the literature and current practise to date in public education; and to draw from the available data, recommendations for programme development and further action within the District relative to handwriting in the context of the language arts programme, as well as the total instructional system. It is understood, at the outset, that the study cannot be thoroughly exhaustive, but that major research is to be examined in detail wherever possible. Opportunities for additional research in special areas may follow as deemed necessary by the users of the study at a future date.

I Historical Perspectives on the Art

Surveys of the research and literature related to handwriting have been reported by many scholars and writers. The most comprehensive document has been compiled by William S. Gray (57, p. 188-245) in his treatment of the world literacy question for U.N.E.S.C.O. This work looks at the total picture, reports major historical research and documents the art around the world up to 1956. Other surveys of both historic and current research and literature are reported by Anderson (4, p. 9-17) (5, p. 18-28), Herrick (70, p. 248-258), Horn (82, p. 168-177), Otto and Anderson (119,p. 570-579), Petty (127, pp 1-8), and Shane and Mulry (144, p. 45-60). The thoroughness of these works bears notation and commendation to the reader. In addition the work of Askov, Otto and Askov (9(a), p. 101-111) has been referred to numerous times in preparation of this paper for the 1960-70 decade. For a comprehensive bibliography of additional contemporary publications, one immediately refers to Ching Y. Suen (153,p. 145-158). In the case of specifically Canadian sources, Sen(154,p.46-52) has provided an invaluable collation of information from language arts and handwriting manuals of the various provinces.

To reconsider the historical perspective of the art at this time would probably prove less than an expedient use of time. The documentation cited above could facilitate greater depth of investigation by any interested individual. Suffice it to say, that few writers are enthusiastic about the current state of the art, and even fewer appear to be doing significant research to subvert its demise.

A re-examination of goals in the teaching of handwriting appears to be a good place to begin. An analysis of the various writings seems to indicate that the primary goal in teaching penmanship is to produce efficiently a free

flow of ideas or easily read thoughts onto paper with a minimum of attention to mechanics of the art. Writers need to be encouraged to write ideas rather than letters or words. In addition, the learner needs to know that he will have accomplished this goal if his writing comes up to a certain standard of legibility within a certain period of time.

In 1927 Ayer(10, p. 45-53) listed eleven objectives for handwriting which elaborate the above primary goal. He recognized legibility and speed as high priorities, but also stressed the needs for students to want to write well, to do so automatically, and to recognize good writing when they saw it. Burns et al (17, p. 335) represent a widely accepted view of our times, "the goal of handwriting instruction today is to teach children to write legibly and with meaning". Lamb (95, p. 210) and Donoghue (28, p. 246) reiterate this statement of purpose. Emma E. Plattor (129,1009) reminds the reader that "Present day goals in handwriting instruction are directed toward the development of power to communicate effectively through written language". More specifically, Kinney (92, p. 5) outlines the following specific objectives: "The teacher's task is to assist pupils to develop satisfactory handwriting by: (a) providing a continuous programme of adequate instruction; and (b) stimulating an interest in handwriting so that pupils will put forth their best effort in all written work". Numerous other sources could be cited which provide outlines of goals and objectives. The above selection seems to summarize current statements in the literature.

Another aspect of the retrospective view is the reported attitudes of teachers and pupils to the topic. Attention has been called to the deficiencies in handwriting by both friends and foes of education. Many educators and journalists are denouncing the inability to write and to communicate ideas as a universal weakness in our social and educational fabric. Many teachers

have resigned themselves to accepting unreadable scrawls, to plus or minus score sheets, and to condoning the sloppiness which seems to have permeated much of modern society. Enstrom (33, p. 83) reminds educators of the hazards to mental health for allowing such attitudes to proliferate:

> "...a person who can't write well -- whose mechanics of handwriting are poor -- often avoids writing if at all possible. This applies to both adults and pupils in school. They feel insecure, inferior, and somewhat ashamed of their miserable attempts. Such a feeling certainly does not encourage the learner in free expression. The answer, of course, is effective teaching all along the way to prevent the deficiency in the first place, or to dissipate it wherever found."

The whole picture spells poor public relations between school administrators on the one hand and business and the home on the other.

Parents can exert a very strong influence on their children's attitude toward handwriting. Parents should be informed concerning the system of writing being taught and why it has been selected. Through a series of parent-teacher conferences, the teacher can help parents understand the kinds of assistance they can give their children without being in conflict with procedures used in the school. The opportunity for interested parents to attend handwriting workshops along with teachers could build stronger and more positive attitudes to the whole topic. In the programme syllabus for the New York City Board of Education (112, p. 35), the following quote recognizes the significance of attitudes towards handwriting:

> " In handwriting, as in every other area of school work, it is important for children to know that home and school are working together. This unity gives children a sense of security as they strive to develop their handwriting skill."

It would appear that modifications in the general attitude towards penmanship of the paying public, teachers, and students may be a major goal if the future emphasis on programmes of handwriting instruction are going to be successfully implemented.

II The Nature of Handwriting Instruction

High initial teaching goals in handwriting are essential to secure the end product that will sustain the pupil in later schooling and in life. Retention and support of all elementary school learnings imply a close co-ordination among elementary, junior high and senior high schools. Common objectives and clear understanding of these objectives are necessary for all teachers lest one group work counter to the others. This is just as important among the three school levels as for the teachers within any one level.

The controversey rages in the literature:

1. When should handwriting instruction begin?
2. Should the programs be formal or informal?
3. Is the integration of handwriting along with spelling, reading and language arts programmes providing sufficient emphasis?
4. Could incidental instruction cover the topic?
5. Is Utilitarian handwriting all that is needed?

The research is inconclusive on all of these topics. However, the following generalization can be drawn:

Mackay (99, 50-52) notes that just as babbling and experimenting with sound are necessary to the development of speech, scribbling and experimenting with parts of letter shapes are necessary to the development of the visual and psycho-motor controls necessary for handwriting. This premise is noted by most other writers, who recommend specific approaches to handwriting during Grade 1. The Addy and Wylie (1,p. 253-254) survey yields further support to this view. In addition, most authors recommend the manuscript form, although some documentation for the cursive approach at this age can also be found.

The references to formal versus informal instruction are likewise inconclusive. It can be noted, however, that the traditional approaches

of "strokes and ovals" in isolated drill sessions appear to have no current advocates in the literature. Rather, formal refers to specific lessons for specific purposes with specific individuals or groups. Smith (147, p. 14) explains the process thus by,

> "Although children are not expected to strive to use the exact form found in any handwriting system (manual or scale) and do not have daily periods throughout the grades devoted to writing lessons, they do spend some class time in practicing better formation of letters.
>
> In contrast with the usual method of teaching handwriting a few years ago, only occasionally are these lessons in which the entire class works on the same skill at the same time.... between the extremes of individual instruction and instruction for the entire class will be instruction to smaller groups formed because a number of students all need help on the same aspect.

Suen (154, p. 46) notes formal instruction is noted in several provincial curricula, but generally refers to a consistency of checking, diagnosis and remediation from early years through senior school. The Alberta curriculum (2, p. 22) notes that "it is the teacher's duty to train them to recognize and make the correct forms properly".

Gray (57, 219) summarizes the formal approach by saying

> "In order to attain the level of mastery desired, Specific features of handwriting must be regularly repeated. This can be done, in part, during special practise periods. But maximum results will not be achieved until the new skills are used daily in purposeful writing activities."

Gray (57, p. 218) also comments on the informal approach thusby:

> "Informal writing activities which are highly motivated should be supplemented early on by special practise periods of short duration. The purpose of these is to inculcate the basic skills required in handwriting. In this connexion, two things need to be kept clearly in mind: pupils who advance slowly in the perception and mastery of the details of words and letters should not be forced to progress more rapidly than their stage of development justifies, and due consideration should be given to individual differences in attempting to acquire the prescribed style of handwriting."

Anderson (6) in 1962 compared handwriting samples from 900 children in England, Scotland, and the U.S. respectively, to determine whether handwriting quality would excel where a "traditional" instructional approach is employed, as in Scotland. Drawing subjects from 7-, 11-, and 14 year-old age groups, he found that the English and Scottish children tended to lose some initial advantage in quality as age increased. In fact the handwriting in the Scottish sample tended to detericrate after age 11, while the mean ratings for U.S. samples tended to increase with age. It appears, therefore, that the "traditional" instruction, operationally defined as that used in Scotland today and in the U.S. earlier in the present century, does not necessarily produce better handwriting than modern instructional programmes.

With respect to the integration of handwriting instruction along with other Language Arts components, Hanigan (109, p. 8) , Vukelich (164, p. 306), Mackay (99, p. 54) and Spalding (149, p.45) all emphasize the need for integration in the instruction of listening, speaking, reading and writing skills. All the above, further emphasize the need for careful instruction in letter formation, with allowances for individuality of personality to show through without sacrificing legibility. There appears to be no statistical research to show that using the solely integrated approach makes for better penmanship, however, Wedell and Horne (165, p. 174-182) found positive relationships existed between a young child's Bender - Gestalt Test score and his subsequent performance in pencil copying, spelling and handwriting tasks. Enstrom's (33, p. 85) admonition that when one becomes teachers of children rather tahan of content, one tends to give help with individual and personal problems, may have application in this context.

Barbe and Lucas (12, p. 208) however conclude that:

> "Combining handwriting instruction into spelling or reading programs might be expected to produce usable handwriting skills. In practice, however, the spelling - handwriting and reading - spelling - handwriting combinations have resulted in little or no attention to handwriting, with the ultimate results that instruction suffers in each of the combined areas."

In addition to the integrated approach noted above, Enstrom (34, p.308) reminds the reader of the necessity for conscious incidental instruction at every opportunity - whether through chalkboard or overhead projection example, through notations on marking papers, or through personal and individual contact. With appropriate instructional support and encouragement, this approach is likely to be most successful with secondary school students.

Barbe and Lucas (12, p. 208) caution, however, that handwriting taught incidentally by teachers untrained in any method of teaching it other that they know how to write themselves too often has produced in otherwise capable children a casual attitude toward the need for legibility. "Incidental teaching of handwriting (often "accidental" in practice) has not been successful in teaching legible letter formation. Incidental instruction is more appropriately used to aid in practice and reinforcement."

Utilitarian writing as noted by Strickland (152, p. 64-73), affords the opportunity for refinement in legibility, form, expression and grammar. It is usually an outgrowth of classroom needs and activities and as such provides excellent and meaningful instructional opportunities. Utilitarian writing, however, must be founded upon formal instruction and independent practice appropriate to the ability and stage of development for each individual student.

In summary, the traditional approach to penmanship seems to have been replaced by less formal approaches which require times for formal instruction to both individual and groups of various sizes. The need for systematic and purposeful practice after appropriate introduction has been emphasized in relation to the integration of the function of handwriting in meaningful language arts programmes.

III Methods and Approaches to Instruction

A. Theories of Learning

In more recent years, approaches to the field of handwriting have taken cognizance of recent developments in learning theory. For many years, the major concerns were with the age of the learner, and his motivation. Both these factors still have considerable impact for any programme. Kinney (92, p. 5), Bell (13, p. 126) and Freeman (52, p. 12) all emphasize the effect of child's growth and development on writing achievement. Furner (55, p. 886-894) (56, p. 1021-1030) (54, p. 61-69), in a series of articles, contends that since handwriting is a type of perceptual- motor learning, methods of instruction should reflect an awareness of perceptual development in the learner (whether child or adult). Furner argues that perceptual development is a learned process which must necessarily involve movement as well as visual and auditory stimulation.

Birch and Lefford (14, p. 164) have shown that intersensory integration, particularly the ability to integrate visual and kinesthetic information, is highly and significantly correlated with the ability of 5-, 6- and 7- year olds to copy a visual image. Thus, teaching the child to integrate different sensory modes could lead to increased handwriting skill.

Apparently the majority of the research in this area has been done with primary children. No research was uncovered which related current theories of learning to handwriting instruction in later years.

B. Readiness and Preparation for Writing

The development and the assessment of readiness for handwriting has received little attention in instructional programmes and in the professional literature according to Wright and Allen (169, p. 430). Barbe and Lucas (12, p. 209) contend that the readiness phase for handwriting is

as important as a sound readiness program in reading. Gray (57, p.211) interprets Maria Montessori's views on readiness:

> " A child acquires mental readiness through experiences that reveal the value of handwriting and promote interest in learning to write. He acquires motor readiness through activities that enable him to learn to hold the writing tool and to engage in the simplest writing movements."

Gray provides additional details of methods used around the world to help children bridge the readiness gap, but notes that little systematic thought or research on how this task can be accomplished is recorded.

Hirsch and Niedermeyer (80, p. 81-86) studied the effects of tracing as a means of encouraging readiness. They concluded that the ability to discriminate letters does not seem to transfer to the formation of letters.

Foerster (46, p. 431-3) makes an ardent appeal to teachers of early school years to discourage tracing as an undesirable practice, except for children who need tactile and kinesthetic reinforcement. Hirsch (80, p.86) documents similar research in this statement:

> "...it may be unwise for teachers to spend valuable time having their students discriminate between correct and incorrect letter forms, since letter discrimination ability does not seem to transfer to letter formation performance."

Donoghue (28, p.251-55) recommends the ten basic factors in assessing readiness for instruction. Wright and Allen (169, p.431) remind the reader that these factors can be assessed by teachers, not controlled. The degree to which the teacher understands the factors, and can assess their development will influence the type of programme and the speed with which it may be introduced to the individual students.

Ebersole (29, p. 145), Anderson (6, p. 178-179) and Lebrun (96, p.206) make numerous recommendations regarding techniques for assessment for readiness which merit further investigation.

Groff (60, p. 208) attempts to dispell another myth relative to readiness and maturation:

> "... the above evidences of the quality of children's handwriting in 1915 and 50 years later, and of the legibility of children versus adults, gives little support to the notion that because children's fine motor skills "increase rapidly in speed and accuracy up to the age of 13 and then more slowly until the age of 17" (Burrows, __, p. 252) that improvements in the legibility of these growing children will keep pace. While it sounds reasonable to say that "as the nervous system matures and motor control improves, the quality of writing should show comparable improvement,"(Boyd, __p. 46-47) unfortunately this is not the case beyond grade 3."

It would seem that Groff is reminding all teachers that they cannot follow the maxims "Give him time and he'll grow out of it". It behooves educations to devise instructional programmes appropriate to the readiness and maturity of the writer / learner at all levels of development.

With respect to the sequence of skill development, Herrick's (69, vp.) extensive 1960 survey of the instructional practices advocated by 19 commercial systems revealled many common practices. No general concensus regarding sequence was observed, although in general, letters classified by similar shapes were introduced together (eg. straight line, slant line, circle). The greatest variation came in upper case cursive and number forms. Noble (116, p. 513-517) generally confirmed the same observations. Numerous programmes are available; the decision to follow one particular sequence or pattern should involve all instructional levels.

C. Styles of Penmanship

In the literature there is the usual divergence among educators as to who is "right" with respect to style. From the point of view of methodology, some resolution is important if an over-all instructional programme is being considered. The three main issues are clearly identified:

1. Vertical vs Slanting
2. Manuscript vs Cursive
3. Personal choice

Freeman (__, p. 25) contends that the issue concerning vertical writing has been pretty well settled in favor of writing with a moderate slant as the most widely adopted style both in the opinions of those who have done research on the subject and of supervisors and textbook writers.

As to manuscript writing, opinions and practice are not nearly so clear cut. Theorists are divided into three camps. The following outline cites the areas and some researchers who have written in their area of concern. No effort is made here to detail the various arguments. Further study can examine each in detail if needed. The camps include:

1. those who would use cursive exclusively
   Ashley (9, p. 162-173)

2. those who would use manuscript writing exclusively
   Anderson (4, p. 9-17) Alberta (2, p. 25) Toronto (160, p. 45) Plattor (129, p. 1009) Harris (66, vp) Hildreth (78, p.3-13) Templin (157, p. 386-389)

3. those who would use manuscript writing in the first two or three grades and then change over to cursive.
   Barbe and Lucas (12, p. 209) Etobicoke (132, p.66) New Brunswick (111, p. 101) Alberta (2, p. 25) Minkoff (105, p 203-204) York (170, p. 19) Toronto (160, p.45) Nova Scotia (__, p. 9) Quebec (134, p.32) Gray (57, p. 259-272) Niemann (115, p. 963)

For the foreseeable future, camp 3 seems to be in the majority... the transition to cursive writing is likely to continue. The tradition of cursive writing is strong. Otto and Rarick (122, p. 211-216) studied the effect of four different transition times -- ranging from early second to late third grade -- upon subsequent performance in handwriting, spelling and reading, and concluded that when the transition is made is less important than what is offered in the instructional programme.

Horton (83, p. 446-450) draws to the attention of the readers various studies related to illegibilities and the specific analysis of same since 1927. In this particular study the analysis deals with sixth grade

students. The results could be extremely useful in developing preventative and for remedial instructional strategies to deal with these malformations thoroughly and efficiently.

For the advocates of personal choice style Smith (146, p. 398) sums up the message, thusby:

> "Few adults write according to the method by which they were taught. Though they spent endless hours in school practicing specific forms of letters, they abandon these letters as soon as they are outside the range of vision of their teacher. If the form being practiced does not come easily for the writer, he adopts a more efficient but (hopefully) still legible style. His personality affects his handwriting and it becomes different from that of anyone else."

In each case, the personal choice advocates are generally referring to the need to allow and encourage individuality and personal preference to show through once the proper letter formations and legibility standards have been internalized.

D. Extent of Time for Instruction and Practice

With respect to the time available for handwriting instruction two studies are most prominent. Herrick and Okada (76, p. 17-32) surveyed approximately 600 school systems in 1962. Their results show that 98% of the teachers indicated that they did in fact teach penmanship. Most schools reported a seperate handwriting class - period of approximately 15 - 20 minutes five (5) times per week in grades 1-4 and three (3) times per week in grades 5-8. Most schools also reported that they incorporate handwriting instruction in a meaningful context in conjuction with subject matter areas. Only one-fifth (1/5) of the schools reported that they individualized instruction.

Fred King (90, p. 483-486) also in 1960 surveyed 68 systems in 4 midwestern states and discovered that 14 different handwriting systems were in use.

In 1973, Addy and Wylie (1, p. 253-254) reported on their A.C.E.I. survey with the following results from 400 Kindergarten through Grade Three teachers in ten U.S. states and British Columbia. Their observations were as follows:

1. The average daily time alloted for formal instruction varies from 11 to 20 minutes per day.
2. Schools in the western U.S. and Canada indicate that they spend slightly fewer days and less time on handwriting instruction than do those in eastern and middle U.S.
3. The first grades spend the most time on handwriting instruction
4. The entire class is taught at one time in the majority of schools (87% rural; 72% urban).

In his survey of the Canadian scene, Suen (154, p. 48) reports as follows:

> "Although handwriting should be practised frequently, the individual training session should be brief and interesting. The Nova Scotia manual recommends a daily practice period of 10 - 20 minutes. The Alberta manual recommends 60 - 75 minutes per week of training divided into several daily periods. The Toronto manual suggests two - 10 minute periods daily. The York manual also recommends the same schedule for Grade I but shorter periods for upper grades plus extra time for remedial work when necessary."

Spalding (149, p. 46) notes that small errors prevent children from learning to write easily, legibly, and neatly. They require careful and continued teaching of all the techniques. Bell (13, p. 128) re-enforces this concept by recommending that every teacher see that each pupil is given planned systematic guidance as well as "on-the-spot-in-daily-work" assistance in understanding and practicing the basic factors that go into the writing act.

The emphasis would appear to be as much on the diagnostic, systematic and individualized instruction as it would be on the amount of time allocated. Each of these elements needs to be carefully balanced to maintain a high level of student interest and motivation.

E. Teaching Techniques and Procedures

Each of the provincial manuals, the majority of language arts text-books, and all commercial manuals and style books treat this topic in great detail. The specifics vary according to the system being advocated. Only a limited amount of research is available to be reported on this aspect.

Only one study, Wiles (167, 412-414) has been reported dealing with the effects of different kinds of paper on the quality of writing of children was found, and it was done in 1943. He found that the size of the handwriting tool and the widths of the ruled paper had no significant effect on writing performance.

Herrick (72, p. 49-50) in 1961 reported an investigation which showed that children prefer adult pencils over beginner pencils.

Later Veal and Davidson (163, vp.) found that writing is definitely effected in both quality and performance by the writer's tools in the 1963 research. This statement was further supported by Tawney (156, p. 59-61) when she found that primary graders performed better with ball-point pens than pencils.

In 1971, Krzesni (94, p. 821-824) reports on his experiment to see if the introduction of the felt pen had any advantageous effect on the performance of third graders when compared to normal pencils and ball-point pens. Based on his findings the following two suggestions can be noted:

1. Children in the third grade or lower should be allowed to use either ball-point or felt-point pens for writing assignments, especially compositions.
2. They should be allowed to continue to use their pencils for noncreative subjects such as spelling and arithmetic, where erasing may prove helpful, and where there seems to be no significant difference in performance as a result of the writing instrument.

In addition, Krzesni confirmed the findings Wiles and Tawney reported earlier.

Halpin (64, p. 267-279) also challenges the traditional theory that special paper is needed for beginning handwriting. A comparison was made of the handwriting of kindergarten children who used four different kinds of paper in their lessons. Results indicated that the width of the writing spaces (one inch or ½ inch) had no differential effect on the quality of beginning writing. This study gives no justification for requiring beginners to use paper which is different from the kind they will use as adults for handwriting.

While the research data with respect to materials and tools is scant, some data has been provided to encourage a re-examination of current practice.

Only limited research is available regarding the effect of various body part positions on writing performance. Finger movement and arm movement have both had their heyday and influence on the art. Smith (146, p.397) and Freeman (52, p. 15-18) present reasoned pleas for movement which is natural, comfortable and practical.

Lurcat (47, p. 209-231) found that the posture was the most important factor affecting the slant of the line.

Callewaert (21, p. 39-52) theorized on the advantages of a modified grip, holding the pen between middle and index finger instead of thumb and index finger. Statistical data is not available on this approach, especially with respect to muscular tension.

Posture is generally well treated in most commercially produced manuals. Here careful observation and remediation by the teacher can avert the development of bad posture habits.

F. Components of Legibility

Legibility is the overall objective in handwriting instruction.

It is commonly defined in operational terms: writing which is easily read and easily written. Because there is no standard alphabet, there can be no precise definition.

The features of legibility can be roughly categorized as:

1. Slant
2. Spacing
3. Size, heights and proportion
4. Alignment and balance
5. Quality of line or pressure
6. Straightness
7. Margins
8. Speed

Here, too, there is remarkably little research reported on any of these aspects. Burns (17, p. 355-6) and Rondinella (139, p. 531-32) both contend that letter formation is the chief factor affecting legibility. Bell (13, p. 127), however, gives the most comprehensive summary of what should be examined when judging legibility according to each of the first seven categories. She emphasizes that all factors need to be considered in individual diagnosis and evaluation of samples. Smith (148, p.8) a noted graphologist, suggests that the overall impression generated by the harmony, connectiveness, grace and flow of the symbols are also important standards.

With respect to speed, Freeman (52, p.4) reminds the researcher that speed can only be accomplished with practice, and can only be maintained with constant use. It is imperative that proper technique has been mastered before speed is increased. Some writers blame the present state of poor penmanship on the pressures placed on young students to produce quantities of written work rather than quality of thought and symbol. e.g. Allen (3,p. 424-429) and Divoky (27, p. 72-76).

It would appear that one of most important elements connected with legibility is the ability of an individual to be able to compare his own calligraphy with master samples or standards, and in so doing diagnose

aspects which merit further attention and remediation. When a penman reaches this stage of devolopment and maturity, one can feel confident that the instructional process has been successful.

IV Handedness: Sinistral, Dextral or Ambidextrous

Over the decades, controversey has raged over handedness, whether it is a natural trait or a learned habit, and whether one should be changed, in fact forced to change, from left to right hand writing positions. Many people can remember the severe reprimands and punishment they have received while being forced to adopt the right-hand position. Work of psychologists and physiologists in this area of dominance have had significant influence on changing educational thought.(Freeman 52, Pp.21). The most reasoned (and most frequently recommended) position to take is that the teachers from a child's early years should attempt to discover his preference, his native preference. It is highly unlikely that the child will be equally skilled with both hands; however, if this were the case, a right hand preference should be encouraged. (Otto 121, p. 353). Similarly, eye preferences can be checked and observed by the teacher to identify natural tendencies. (Trembly 162, p. 107). Parents need to be involved in the discussions, observations and decisions related to preferences and any changes involved. Similarly parents need to be encouraged and assisted in helping their children practice only one pattern in the knowledge that handedness is natural and individual.

The New York manual (112, p. 29) notes "The co-operation of the home is enlisted as early as possible and with understanding and in a relaxed atmosphere , the child can learn to write without developing awkward mannerisms."

One of the definitive works on left handed writers and their instruction has been done by Enstrom(41, 573-577). His report done in 1962 deals with the relative efficiency of various approaches to writing with the left-hand.

Comparisons of left - and right-handed subjects handwriting performance have been made in a number of studies. Reed and Smith (136, p. 275-288) examined the speed and quality of work done by 10-,12-, and 14- year-olds

using subjects of both hands. No significant difference due to handedness were found on speed of writing, either on a repetitive passage or on a copied prose piece. Likewise, no significant quality preference was noted by the judges. Groff (64, p. 368) and again in (63, p.95) confirms these findings. These observations are useful documentation for parents who are concerned that their child is not writing normally when his preference is other than theirs. It is also useful data to share with sinistrals to encourage them to work on technique which builds their own confidence and appreciation for the quality of the finished product.

Lewis (97, 1786-87) in 1964 analyzed the ability of first graders to copy the manuscript alphabet and found that the left-handed children made more errors than right-handed children before formal instruction. After instruction, however, no significant differences were found in the total number of errors, although left-handed subjects made slightly more reversal and inversion errors.

Perhaps teachers need to heed fairly recent admonitions to make special provision for left-handed writers. Croutch (26, p. 283-284) presents suggestion about the correct position for the body and paper for both left- and right-handed writers. The New York manual (112, p. 29) notes the following points emphatically:

> "A left-handed child will learn to write easily, rapidly, comfortably, and legibly under suitable conditions. The teacher helps to remove some emotional pressure from the child by not making him feel that he is the cause of undue trouble to her...
> If there is more than one left-handed child in the class, it is advisable to have them seated near each other...)

Kinney(92, p.29) provides the following specific direction for work with lefties:

> "Correct placement of paper is the main adjustment the left-handed writer has to make. For manuscript writing, the bottom of the paper should be parallel to the bottom edge

> of the desk, just as for the right-handed writer. For cursive writing the pupil must be taught to tilt his paper at the opposite angle from that of the right-hander. That is, the bottom right hand corner of the paper should be pointed at the body so that the writing arm will be perpendicular to the bottom edge of the paper. It is hard to write in the upside-down style if the paper is placed in this position...
>
> Encourage left-handed writers to develop a writing slant which feels natural and good. Some will find it easier to use vertical stroke."

For further particulars on special attention, one is referred to the personal experiences described by Ramos (135,p. 83-84) and by Foerster (45, p. 214) both of whom provide specific and practical suggestions for instruction and remediation.

Otto (121, p. 353) reminds educators that left-handers (and right-handers too) left to their own devices frequently develop awkward approaches, including "hooked" positions because they are attempting to imitate their colleagues. With a minimum of instruction, they, too, can learn to write comfortably and well. He notes that

> "Insofar as possible, handwriting instrution to both left- and right-handers in a single group should be avoided and left-handed children should be seated together in order to prevent their emulating the movements and positions of right-handed pupils...
>
> ...Again, insofar as it is possible, the teacher should attempt to show the left-handed child what to do rather than merely tell him... A right-handed teacher needs to expand some energy, both physical and psychological, if he hopes to understand and to help the left-handed pupil."

Foerster (45, p. 214) also recommends that "team teaching" handwriting with a left-handed colleague may help resolve some demonstration problems, and provide greater empathy between teacher and learner. It might also be practical to train a left-handed teacher-aide or older child to demonstrate as a good model for position of body, hand and paper.

In addition, many writers urge the use of the chalkboard for practice, where supervision can be more closely done, where greater freedom of movement

is allowed, and where good left to right orientation can be watched carefully.

Several writers note that sinistrals need desks which are comfortable, with left arm rests, and slightly lower than for right-handers of the same height, so they can see what they are writing. Lighting should be adequate and over the right shoulder so that the hand will not cast a shadow over the writing surface.

Regardless of the handedness of the student, there is no substitute for careful teaching and attention to details during the early years so that children will avoid forming habits which are not conductive to legibility and fluency.

In spite of these best teaching efforts the standard position for good writing feels wrong for many lefties. They will write their own way inspite of instruction, particularly in the early teen years.

Drummond (109, p. 15) adds the following concluding note:

> "Good citizens write legibly - and it is better to have a co-operative, enthusiastic lefty who writes legibly upside-down than to have a disgruntled, antagonistic, lethargic lefty, with a properly placed wrist, who does not choose to write at all."

V Special Learning Disabilities

Considerable research and documentation in the past decade has been carried out relative to the handwriting needs, abilities and techniques appropriate for children with specific learning disabilities and for persons with mental handicaps. The scope of this paper does not permit detailed discussion; however, the following outstanding references are noted.

The majority of the articles appearing in the fall 1968 issue of Academic Therapy have been compliled by Arena (8) and provide exceptional theoretical and practical treatment of this topic. It should be required reading for any teacher working with children in this category.

The following additional references are indicators of the scope of some current reporting in the field. The teacher who works in this area should be encouraged to pursue these and other professional articles.

McElravy, Anna, "Handwriting and the Slow learner," Elementary English, 1964 vo. 41, p. 865-868.

Enstrom, Erick A., "Out of classroom; handwriting for the retarded," Exceptional children, 1966 vol. 32 p. 385-388

Parres, Richard M., "The Body midline as a psychoeducational variable affecting the handwriting habits of mentally retarded children," Dissertation Abstracts, 1969 vol. 29, no. 10 p. 3468-3469.

Chapman, L.J- and K. Wedell, "Perceptual motor abilities and reversal errors in children's handwriting "Journal of Learning Disabilities June 1972 Vol. V, no. 6, p. 321-330.

McNees, Margaret C. et al, " Modifying cluttered handwriting," Academic Therapy 1972, Vol. VII, no. 3, p. 293-295.

Mullins, June, et al., " A handwriting model for children with learning disabilities." Journal of Learning Disabilities, May 1972, Vol. V, p. 58-63.

Hanson, Irene W- "Teaching remedial handwriting," Language Arts, P. 428-431+.

Fauke, Joyce et al, "Improvement of handwriting and letter recognition skills: a behavior modification procedure," Journal of Learning Disabilities, 1973 Vo. VI, no. 5, p. 296-300.

Carter, John L. and Donald Synolds, "Effects of relaxation training upon handwriting quality," Journal of Learning Disabilities, April, 1974 vol. VII, no.4, p. 236-238.

No attempt has been made to be all inclusive; rather, to provide initial suggestions with diverse points of view. It is hoped that what is offered here will be tried, explored, varied, expanded, and creatively used to help all children, including those with special needs.

VI Evaluation: The Process and Its Implications.

The success of the handwriting instructional programmes is constantly being evaluated by the consumer public and by parents in general. The yardsticks of measurement are frequently tradition and memory. This section will attempt to treat the following components of the evaluation process:

A. Diagnosis
B. Scales and Measurements
C. Remediation
D. Grading, and Influence on Marks
E. Standards

Efforts will be made to locate relevant literature and validated research on each aspect, in the hopes that recommendations for local programmes can evolve.

A. Diagnosis

That great differences exist in every aspect of writing is shown by every study that has been examined. This can be seen most readily in the features of writing that can be most easily measured, namely, speed, quality, and legibility. The classroom teacher's problem is to know what do do, and what to avoid, especially in causes which are natural rather than learned.

Freeman, (52, 20) suggests the diagnosis of some faults depend upon the child awareness of same, and in other cases in the teacher's ability to cause a child to be aware of them. He specifically mentions faults in the way one writes that have to do with posture, position and movement. The subtler matters of rhythm, speed of movement, and ease and lightness of movement are best shown by example. Corrective training is usually not effective unless the pupil recognizes his deficiencies and is eager to be helped. (regardless of age).

Mann, (103, p. 133) provides the most concise categorization of difficulties in handwriting which teachers may use as a guide in analyzing writing

samples and diagnosis of writer problems. He outlines the following student-based difficulties :

1. Lack of readiness for beginning writing may be a factor in that the child may exhibit fine motor dysfunction of the hands and fingers or poor eye-hand co-ordination.
2. The learner may have a visual acuity problem and need glasses.
3. The child cannot grasp the pencil correctly or has an awkward writing position. He may have crippled hands or an undetected spastic condition.
4. The student may not have established a dominant hand (even after second grade). He may be switching from left to right.
5. The learner may have difficulty retaining visual symbols rather than poor visual-motor co-ordination.
6. The student may have an emotional problem which can easily show up in deteriorating handwriting. He could be physically ill. (See also Smith 148, p. 4-5 and Tenaglia 158, p. 775)
7. The child may have no interest in writing and be unwilling to practice. He may exhibit indifference to establish minimum standards.

In a similar vein, Mann continues by outlining the following programme-based difficulties:

1. The child may have been started in a formal writing program before he was ready. Possibly he is still undecided as to which hand to use.
2. There could be insufficient interest on the part of the student due to undifferentiated group drill. The wrong positioning of the paper may be a factor.
3. Not enough care taken with initial teaching may have been a factor, and the child was allowed to practice errors. Too much practice done without supervision can cause difficulties.
4. A poorly planned transitional program from manuscript to cursive writing may be the cause of the problem in the older child.

while the above lists deal in broad categories,other writers have looked at more specific kinds of problems which need diagnosis from both the student and the programme points of view.

Horton (83, p.446) cites the following historical work on diagnostic topics, especially related to illegibilities.

> "In 1927, S.L.Pressey published the results of a pioneer investigation in the field of specific analysis of illegibilities. In 1932, T. Ernest Newland analyzed the illegibilities in the development of handwriting from the lower grades to adulthood. Lewis and Lewis reported the results of a 1960 study in which they analyzed the errors in the formation of manuscript letters by children in first grade."

Application of the Newland findings would involve the diagnosis and remediation of problems peculiar to each child, the assumption being that by

correcting specific illegibilities the general quality and speed of the handwriting would be improved.

Boyle (16, p. 642) compared the handwriting achievement of 312 children in grades 4-6 who were enrolled in control and experimental classes. In the experimental treatment instruction was planned on the basis of diagnostic treatment. Though there were no significant differences between the two groups obtained on gross measures, but the experimental subjects eliminated significantly more errors in the size, slant and formation of letters. The results of this study again give evidence that pupils can improve their handwriting if they are taught by an individualized diagnostic approach.

Tagatz et al (155, p. 234-239) used two studies to compare the effects of three instructional strategies with third and fourth graders. The two approaches that stressed individualization and diagnostic methods produced statistically greater gains in legibility than a formal approach.

In conclusion, one might observe that only when the learner knows and understands what he is trying to achieve in handwriting can he participate profitably in evaluation. And only through evaluation and systematic diagnosis can he understand how to work toward self-improvement. Evaluation is the link between the student's understanding of the techniques and the achieving of the handwriting goals in the learning process.

B. Scales and Measurments

The first handwriting scale, The Thorndike Scale for Handwriting (Teachers College Press), was developed by E.L. Thorndike. The scale includes handwriting at 15 different quality levels, ranging from very poor, barly legible to beautifully formed writing of a quality that might serve as a model in a penmanship manual. The criterio used in developing these samples included some consideration of beauty or pleasing quality as well as absolute clarity and uniformity of line and form.

In 1912, a scale developed by L.P. Ayers appeared designed for use in grades 2 through 8 and presented 8 quality levels. His criterion was readability rather than Thorndike's "general merit".

In 1915 (revised in 1959) Freeman developed a scale to meet the following specifications:

(1) a series of scales, one at each grade level from 1 through 8
(2) national scope
(3) ratings on general merit, with the primary emphasis upon legibility and form;and
(4) scale specimens selected to show balance in all elements of form - spacing, alignment, letter formation, and uniformity in size and slant.

The scale consists of five quality levels at each grade level; grades 1&2 done in manuscript style and 3 through 8 in cursive style.

P.V. West in 1926 developed still another scale (revised in 1957 by the Palmer Company) which included also a speed criterion with 7 quality levels per grade.

Apparently the scales described above are the ones most widely used for purposes of providing samples and rating the quality of production.

Such scales have several limitations. Primarily, they show stages of "perfection" to which one can aim. For the average classroom there would probably be numerous levels between each pair of specimens where students' work could be categorised. The measurement of day-to-day improvement within such scales is the desired aim. It is most realistic to show him where he is now and how he is progressing from there on a continuum to better work. Any one of the above scales can serve, once a minimum standard has been set, for a district, for a school and for a classroom as a screening device for locating pupils who need remedial assistance and encouragement.

Rondinella (139, p. 109) found that teachers who were not trained or experienced in the use of the above scales were subjective in their ratings of handwriting samples.

When asked to state their criteria used in making their judgments, the teachers named 14 categories, of which only 5 were considered in the widely used Freeman scales. One might conclude from this that teachers need training in using scales as diagnostic, measurement and prescription devices. It may be assumed that once the training and practice has internalized the concepts, ratings could continue with less dependence on the scales.

The features of handwriting which are most important and which can be measured with reasonable accuracy are speed and quality. Both classroom teacher and principal should be aware of the values and limitations of such measurement also as a diagnostic to build and revise more effective and efficient school programmes of both a formal and informal nature.

C. Remediation

The fundamental principles of good writing are the same for all grades. In the upper elementary grades the tendency appears to be the use of handwriting periods for remedial purposes - - that is diagnosis and correction of faults that have been revealed in pupil's daily work. This practice is based on the assumption that teachers are knowledgeable about the standards used in the system; that they have internalized the key points of quality outlined in rating scales and standards; and that sufficient time is provided for an individualized approach. A further assumption is that the students have been taught the proper techniques of legibility.

It is nature that no two pupils will write exactly alike. Uniformity should not be expected. However, teachers who accept writing of mediocre quality on the pretense that it is an individual's style do neither parties a favor.

With the exception of articles written for special education learning disabilities programmes already discussed in section V, one of the most comprehensive works on remediation may be found in Otto (121, p. 355+).

For persons interested in a detailed presentation, this section is a priority. He outlines in particular the work of Newland (1932) - - a landmark study on correcting specific difficulties. Additional studies done by Quant (1946), by Hunnicutt and Iverson (1958) and by Lewis and Lewis (1965) are also summarized by Otto and provide excellent working material.

In the case of remediation, some questions are posed by Fred King (91, p. 17) with respect to the effect of poor school practices on the handwriting it produces. For example:

> 1. Is too much written work required and too little time allowed for its completion? or phrased another way; Are the written demands appropriate to the technical skill abilities of the writers of whom they are demanded?

King comments that "theorically" the quality of work should not decrease because the amount of work has increased. If we continue to maintain high standards and insist on quality work, the assignments of increasing amounts of written work should not be a contributing factor provided appropriate transcription time is available to meet individual needs. A strong programme of closely supervised instruction implemented consistently across the elementary school years would provide a skill level appropriate to cope in most cases. Silverberg (145, p. 74) on the same topic says:

> "If a child writes poorly or is anxious about writing, cut down the amount of writing required. See if teaching him to type works better. Let him show what he knows by telling it or dictating it into a talking typewriter... most adults write very little. Give the kids a break too."

> 2. Does the school contribute to poor handwriting habits by accepting poorly written work?

King's observation is that the weakness is one that is related to the total penmanship programme.

In many instances teachers assume that the total instructional programme has been completed by about grade four and that continued formal practice is

unnecessary. A total team effort across all grades and in all subjects is imperative.

Functional learning in handwriting has a place in the busy crowded school day. It needs to be supplemented with regular handwriting lesson periods for those children who need them until good progress is shown in this skill development. Westbrooks (166, p. 100-106) presents a humorous and practical way of approaching remediation activities for intermediate grades. Creative teachers need to be encouraged to develop handwritten instruction periods, both regular and remedial, into artistic and satisfying experiences for all concerned.

D. Grading, and Influence on Marks

Paper characteristics such as handwriting quality and composition errors have been identified in research as factors significantly affecting the grades of an essay exam or major written project by Chase (24, p. 315-318); Klein and Hart (93, p. 197-206) and Scannell and Marshall (141, p. 125-130). However the literature has not been conclusive as to the relative effects of these factors on grades assigned.

In 1971, Marshall (104, p. 213-215) took 16 forms of an essay exam, identical in content but differing in writing neatness and number of composition errors and had them graded by 480 Secondary (7-12) classroom teachers. He concluded that teachers are influenced by composition quality on essay exams even when they attempt to grade solely on content. In addition, significant differences were found between the mean grades assigned to the "neat" handwritten paper and to the "fair" handwritten paper, and also between the paper containing no composition errors and those papers showing spelling and grammar errors.

Based on this data, one might observe that students need encouragement

to produce their most legible material for course evaluation purposes (or else learn to type); and secondly, that teachers should be encouraged to be alert in their grading procedures to accommodate the influence of the penmanship factor. Some writers suggest on mark for content, and another mark for composition, including spelling, grammar and penmanship.

E. Standards

The standards observed across the country seem to be as numerous as the reporters. As was pointed out in Section B - Scales and Measurement, the standard must be set at the local level. Systems can inaugurate total programmes; schools can "buy-in" to the package; but teachers set the final standard by what they will accept as satisfactory. (Kinney 92, p. 31). Ultimately, one could say the learner is in control for he sets the standard to which he wishes to progress, and the teacher motivates him to reach a goal.

Across Canada, Suen (154, p.49-50) reports considerable data provided through various provincial and district quides and official manuals. The information ranges from generalized evaluation statemnets to specific "speed" quotations from Toronto and Alberta. One assumes that each manual quoted provides more explicit information relative to the methods for arriving at evaluations using these standards.

Freeman (52, p. 4-5) seems to have written most succinctly on the topic of standards - - speed and quality. He draws on the research to provide scales for both topics, but reminds the reader that standards are necessary for efficient performance. Standards are designed to serve as targets rather than barriers.

It is the reponsibility of each school (and system) to define its standards wh n it outlines its objectives and goals for the programmes.

In this way all participants (including the parents) know what the minimum expectations will be.

VII Teacher Preperation and Training

Very little has been written concerning institutional training programmes for teachers in handwriting. In 1961, Fred King (90, p. 483-486) found that in 680 school systems surveyed, only 9% required some kind of training in handwriting for elementary teachers. Emma Plattor (128, p.131A) studied various types of preservice training programmes for teachers. Her results showed a significant positive correlation towards the subjects who received specially designed programmed instruction over the control group. On the basis of this study it appears that some kind of preservice instruction should be pursued to improve the understandings and standards among new teachers.

Enstrom (34, p. 309) comments that teacher training could wisely include some basic instructions in chalkboard writing for high school teachers. In the York manual (170, p. 28-29) there is a specific section on blackboard writing for teachers. It urges them to write very carefully using consistent letter forms at a reasonable speed. This is critical since students tend to imitate the teacher's model. (Quebec 134, p.31).

Some school districts have taken on the reponsibility of developing localized training programmes. Leadership in this field may come from local teacher initiative and/or from administrative support and direction. The degree to which standards of handwriting are a priority in the system will ensure that such programmes be promoted and endorsed. It would appear that teachers at all levels could benefit from refresher discussions on such topics as purpose, methodology, standards and motivation. The production of appropriate visual aids might be a valuable vehicle for re-kindling an awareness of the subtler aspects of the art.

There is no answer for combatting any educational weakness other that

the installation of strong programmes implemented by trained and experienced teachers. Instructional weakness can be replaced by instructional strength.

VIII Summary

The ability to communicate with written symbols on paper is often a determining factor in whether a student is able to achieve in the modern academically oriented education structure. Many people with otherwise normal ability are often unable to put their thoughts on paper, not because of thinking disorders, but rather because of writing handicaps.

Handwriting is personal and is very much a part of the student and of the way he presents himself to the world. The increased self-confidence engendered by handwriting of which he can be proud is a by-product of no mean value.

Interest, purpose, and need - - these are the motivations that lead to readiness to write, or to change a style of writing. With an appropriate understanding of purpose, time will be found by both teacher and student to follow instructions, to practise, to diagnose illegibilities, and to relearn as necessary. It is imperative that teachers at all levels be aware of the system being adopted and promoted in the district; that they have had training in the techniques of handwriting in that system, including special help for teaching writers with handedness dominance other than their own. Special instruction, assistance and resources need to be made available to both teachers and students with special learning disabilities.

Evaluation of the process and product needs to be done both formally and informally on a continuing basis by both teacher and student. Standards are to be established as targets at which to aim for perfection, rather than barriers to hold back the less able.

The overall objective for any handwriting programme must be to provide each learner with a personal and individualized tool with which he can express himself efficiently and effectively.

IX Recommendations

It is recommended that the following actions be considered for implementation on both a long range and short term basis according to priorities for the handwriting improvement in the system.

1. That a system-wide survey be undertaken to reveal the present state of the art, and to include the following aspects:

- 1.1 Current professional training, courses, etc. held by teachers at all levels in handwriting methodology.
- 1.2 Scales, models and standards of measurement now used for grading and evaluation
- 1.3 Amount of time spent daily or weekly on
  - 1.3.1 formal instruction
  - 1.3.2 individual and/or small group instruction
  - 1.3.3 diagnosis and remediation
- 1.4 Degree to which instruction is correlated with
  - 1.4.1 Language Arts
  - 1.4.2 Other content subjects
- 1.5 What materials and tools are currently used
  eg. pencil, ball-point or felt-point pens, size and kinds of paper, etc.

2. Based on the above data, there should be an examination of currently available commercial programmes to identify components which would meet the defined needs of the system

- 2.1 Does it accomodate current theories of learning with respect to readiness, to visual, motor and perceptual needs?
- 2.2 Does it provide a variety of approaches, including visual, auditory, tactile and kinesthetic and still maintain consistency of standard for letter formation in each approach?
- 2.3 Does it offer training methods and techniques for both manuscript and cursive styles?
- 2.4 Does it provide specialized consultant or resource personnel to assist in the introductory training programmes, and subsequent workshops?
- 2.5 Are there performance standards for speed and quality provided with the programme which are authenticated for the Canadian scene, and related to the four major standard scales?
  (Thorndike, Ayers, West, Freeman).

3. Initiate a series of re-training options for the teachers in the system,

- 3.1 Co-operatively with local universities as
  - 3.1.1 credit programme in arts and/or education
  - 3.1.2 non-credit open to the general public and of sufficient duration to demonstrate results.

3.1.3 an experimental research programme related to the effects of training, etc.

3.2 Through programmes offered by the commercial firms to
- 3.2.1 Introduce the concepts in a new or revised programme
- 3.2.2 Provide follow-up workshops for both parents and teachers through the ERC services.

3.3 Through local resource personnel developing systematic and continuous workshops at either school or E.R.C. levels for
- 3.3.1 All teachers on the Supply List and substitute call list, so that they can have specific training in an art which can be used at every opportunity they have.
- 3.3.2 All teacher-aides so they will be knowledgeable and skilled to help children with practice and model development.
- 3.3.3 Groups of teachers at various locations according to their expressed needs.
- 3.3.4 All consultant personnel so that they can have a thorough understanding of the principles, and can facilitate their integration into all areas of instruction.

4. That the system make a commitment to one style of handwriting for formal instructional purposes, and that standards be provided to guide teachers in the instruction.

5. That schools at all grade levels be urged to accept this system and to follow it during a specific period of time so that evaluation and measurements can be made.

6. That classroom teachers be urged to make a conscious time commitment to formal instruction on a small group basis, and to individualized diagnostic instruction for all students each week.

7. That specific instruction be provided for persons who write on chalkboards and overhead projectors with respect to letter formation and legibility.

8. That appropriate visual materials be provided or developed to show good models of writing form and practice.

9. That each teacher in the system become a conscious teacher of penmanship in all content areas at all grade levels.

10. That appropriate evaluation and research projects be undertaken on an on-going basis on aspects outlined in this total paper on an individual basis, through the Universities, through the Manitoba Educational Research Council, and with the Manitoba School Trustees Association.

11. That efforts be made to keep the parents and general public informed of work in this field, and to solicit their assistance in its implementation, evaluation and improvement.

X Bibliography For Footnotes

1. Addy, Polly and Richard E. Wylie, "The 'Right' way to write," Childhood Education, Vol. 49, No. 5, February, 1973, p. 253-54.

2. Alberta. Department of Education. Interim Elementary Guide for Handwriting, 1965. 40pp.

3. Allen, Elizabeth G. and Jone P. Wright, "Personalizing handwriting instruction," Elementary School Journal, Vol. 70, (April,1974), p. 424-429.

4. Anderson, Dan W., "Handwriting Research: Movement and Quality," in Horn, Thomas A. (ed.), Research on Handwriting and Spelling, Champaign,Illinois: National Council Teachers of English,1966. p. 9-17.

5. Anderson, Dan W., "Handwriting Research: Style and Practice," in Horn, Thomas A (ed), as above p. 18-28.

6. Anderson,Irving H., Comparisons of the Reading and Spelling Achievements, and Quality of Handwriting of Groups of English, Scottish and American Children Ann Arbor, Michigan: U.S. Department of Health, Education and Welfare, Office of Education, Co-operative ResearchProject No. 1903, University of Michigan, 1963.

7. Anderson, Paul S. Language Skills in Elementary Education. 2nd ed. New York: Macmillan Co., 1972. p. 197.

8. Arena, John I., (ed.) Building Handwriting Skills in Dyslexic Children. San Rafael, California, Academic Therapy Publications, 1970. (whole issue).

9. Ashley, Rosalind Minor. Successful Techniques for Teaching Elementary Language Arts. West Nyack, N.Y: Parker Publishing, 1970. pp. 162-173

9A. Askov, Eunice, Wayne Otto, and Warren Askov. "A Decade of Research in Handwriting: Progress and Prospect," Journal of Educational Research, Vol. 64 No.3 (November, 1970) pp. 101-111

10. Ayer, Fred C., "The Attainment of Objectives in Handwriting," Elementary School Journal Vol. 28 (Sept. 1927 - June 1928) pp 45-53

11. Ayres, Leonard P., A Scale for Measuring the Quality of Handwriting of School Children. New York,N.Y.: Russell Sage Foundation, 1912.

12. Barbe, Walter B. and Virginia H. Lucas, "Instruction in Handwriting: A New Look," Childhood Education Vol. 50, No. 5 (February, 1974) pp 207-209.

13. Bell, Mary Elizabeth, "Evaluating the Quality of Handwriting," Education, Vol. 90, No. 2 (Nov - Dec,1969) pp 126-129.

14. Birch, H.G. and A. Lefford,"Visual Differentiation, Inter-sensory Integration, and Voluntary Motor Control," Monographs of the Society for Research in Child Development, Vol. 32 No. 10, 1967 (whole issue).

15. Boyd, Gertrude A., Teaching Communication Skills in the Elementary School. Van Nostrand, 1970 pp. 46-47.

16. Boyle, Sister Mary Charles, "An Experimental Study of a Diagnostic-Remedial Program in Handwriting in the Fourth, Fifth and Sixth Grades," Dissertation Abstracts, Vol 24 No. 2, 1963 p. 642

17. Burns, Paul C., Betty L. Broman and Albert L. Lowe Wantling. The Language Arts in Childhood Education 2nd ed. Chicago: Rand McNally, 1971 p. 355-6.

18. Burns, Paul C. and Leo M. Schell. Elementary School Language Arts: Selected Readings. Chicago: Rand McNally, 1969 p. 382-394

19. Burrows, Alvina T., Dianne L. Monson and Russell G. Stauffer, New Horizons in the Language Arts. New York: Harper, 1972. pp. 249-252.

20. Byers, Loretta, "The Relationship of Manuscript and Cursive Writing to Accuracy in Spelling," Journal of Educational Research, Vol. 57 (Oct, 1963) pp. 87-89.

21. Callewaert, H., "For Easy and Legible Handwriting," in Herrick, Virgil E. (ed.) New Horizons for Research in Handwriting, Madison, Wisconsin: University of Wisconsin Press, 1963 pp. 39-52.

22. Carter, John L., and Donald Synolds, "Effects of Relaxation Training upon Handwriting Quality," Journal of Learning Disabilities Vol. 7, No. 4 (April, 1974) pp. 236-238.

23. Chapman, L.J. and K. Wedell, "Perceptual - Motor Abilities and Reversal Errors in Children's Handwriting," Journal of Learning Disabilities, Vol. 5 No. 6 (June, 1972) p. 321-330.

24. Chase, C.I., "The Impact of Some Obvious Variables on Essay Test Scores," Journal of Educational Measurement Vol 5 (1968) p. 315-318.

25. Craig, Myrtle C., "An Analysis of the Relationships Between the Ease of Reading Sixth Grade Handwritten Papers by Peers and Teacher Evaluation of the Handwritten Papers with selected Handwritten Factors," Dissertation Abstracts, Vol 27, No. 2 (1966) p. 325-A.

26. Croutch, Ben, "Handwriting and Correct Posture," Academic Therapy, Vol 4 (Summer, 1969) pp. 283-284.

27. Divoky, Diane, "The Silverbergs: Education's Iconoclasts," Learning, (February, 1975) p. 72-76

28. Donoghue, Mildred R. The Child and the English Language Arts. Dubuque, Iowa: Wm. C. Brown, 1971 pp. 246-284.

29. Ebersole, Marylou, Newell G. Kephart and James B. Ebersole, Steps in Achievement for Slow Learners. Columbus, Ohio: Charles E. Merrill, 1968 p. 145.

30. Enstrom, Erick A., "The Decline of Handwriting," Elementary School Journal, Vol 66 (Oct, 1965) p. 22-27.

31. Enstrom, Erick A., "The Extent of the Use of the Left Hand in Handwriting and Determination of the Relative Efficiency of the Various Hand- Wrist- Arm- Paper Adjustments." Unpublished doctoral dissertation, University of Pittsburgh, 1957

32. Enstrom, Erick A., "Handwriting: A Sorry Plight," Contemporary Education, Vol 41 No. 3 (January, 1970) p. 133-136.

33. Enstrom, Erick A, "Handwriting in High School," Clearing House Vol 35 No. 2 (Oct, 1961), p. 83-86.

34. Enstrom, Erick A., "Handwriting: The Neglect of a Needed Skill," Clearing House, Vol 40, No. 5 (January, 1966) p. 308-310.

35. Enstrom, Erick A., "Hen-Tracks in High School," Journal of Secondary Education, Vol 40 (April, 1965) p. 184-186.

36. Enstrom, Erick A., "Little Turn that Makes a big Difference," Elementary English, Vol 43 (1966) pp. 865-868.

37. Enstrom, Erick A., "Out of the Classroom; Handwriting for the Retarded," Exceptional Children Vol 32, (1966) pp. 385-388.

38. Enstrom, Erick A., "Paper Placement for Manuscript Writing," Elementary English, Vol. 40 (1963) pp. 518-522.

39. Enstrom, Erick A., and Doris C. Enstrom, "Practical Teaching Methods for Primary Handwriting Skills," Academic Therapy, Vol 7 No. 3 (Spring, 1972) pp. 285-292.

40. Enstrom , Erick A. and Doris C. Enstrom, "Reading Help For Lefties," Reading Teacher, Vol 25 No. 1 (October, 1971), pp. 41-44.

41. Enstrom, Erick A., "The Relative Efficiency of the Various Approaches to Writing with the Left Hand," Journal of Educational Research, Vol 55, (August, 1962) pp. 573-577.

42. Erlebacher, Adrienne, and Virgil E. Herrick, "Quality of Handwriting Today and Yesterday," Elementary School Journal, Vol 62 (1961) p. 89-92.

43. Fauke, Joyce, et al. "Improvement of Handwriting and Letter Recognition Skills: A Behavior Modification Procedure," Journal of Learning Disabilities, Vol 6, No. 5, (May, 1973) pp. 296-300.

44. Foerster, Leona M., "Let's Be Realistic About Handwriting Evaluation," Elementary English, Vol 51 No. 5 (May, 1974) pp. 741-742.

45. Foerster, Leona M. "Sinistral Power! Help for Left-Handed Children," Elementary English, Vol 52 No. 2 (February, 1975) pp. 213-215.

46. Foerster, Leona M. "Teacher - Don't Let Your First Graders Trace!" Elementary English, Vol 49, No 3 (March, 1972) pp. 431-433.

47. Fouasse, Gerald A. Handwriting, a term paper presented to Dr. O.S. Trosky, Faculty of Education, University of Manitoba, August 5,1977. Mineographed.

48. Freeman, Frank N., "An Analytical Scale for Judging Handwriting," Elementary School Journal, Vol 15 (April, 1915) pp. 432-441.

49. Freeman, Frank N. "An Evaluation of Manuscript Writing," Elementary School Journal, Vol 36 (February, 1936) pp. 446-455.

50. Freeman, Frank N. Handwriting, in Monroe, W.S. (ed) Encyclopedia of Educational Research, New York: Macmillan, 1941.

51. Freeman, Frank N. "Survey of Manuscript Writing in the Public Schools," Elementary School Journal, Vol 46 (March, 1946) pp. 375-380.

52. Freeman, Frank N., Teaching Handwriting - - What Research Says to the Teacher (No. 4) Washington, D.C.: National Education Association, 1954.

53. Freeman, Frank N., "The Transition from Manuscript to Cursive Writing," Elementary English, Vol 35, (1958) pp. 366-372.

54. Furner, Beatrice A., "An Analysis of the Effectiveness of a Program of Instruction Emphasizing the Perceptual-Motor Nature of Learning in Handwriting," Elementary English, Vol 47 (1970) pp. 61-69.

55. Furner, Beatrice A., "The Perceptual-Motor Nature of Learning in Handwriting," Elementary English, Vol 46, (1969) pp. 886-894.

56. Furner, Beatrice A., "Recommended Instructional Procedures in a Method Emphasizing the Perceptual-Motor Nature of Learning in Handwriting," Elementary English, Vol 46 (1969) pp. 1021-1030.

57. Gray, William S. The Teaching of Reading and Writing: An International Survey for UNESCO. Chicago: Scott Foresman, 1956 pp. 188-244.

58. Groff, Patrick J., "Can Pupils Read What Teachers Write," Elementary School Journal, Vol 76, No 1 (October, 1975) pp. 33-39

59. Groff, Patrick J., "From Manuscript to Cursive - - Why? Elementary School Journal, Vol 61, (1960) pp 97-101.

60. Groff, Patrick J., "The Future of Legibility," Elementary English, Vol 50 No. 2 (February, 1975) p. 205-220.

61. Groff, Patrick J., 'Preferences for Handwriting Styles by Big Business," Elementary English, Vol 41 (December 1964) pp. 863-868.

62. Groff , Patrick J., "Self-Estimates of Teaching Ability in Elementary School Subjects," Journal of Teacher Education, Vol 13 (December, 1962) p. 417-421

63. Groff, Patrick J., "Who Are the Better Writers -- The Left Handed or The Right Handed?" Elementary School Journal, Vol 65 (November, 1964) pp. 92-96.

64. Groff, Patrick J., "Who Writes Faster?" Education, Vol 83 (1963) pp. 367-369.

64A. Halpin, Glennelle and Gerald Halpin, "Special Paper for Beginning Handwriting: An Unjustified Practice? Journal of Educational Research, Vol. 69 No 7, (March, 1976) pp. 267-269.

65. Hanson, Irene W., "Teaching Remedial Handwriting," Language Arts 1972, pp. 428-432.

66. Harris, Theodore L. Handwriting, in C.W. Harris (ed.) Encyclopedia of Educational Research. Third ed. New York: Macmillan, 1960.

67. Harris, Theodore L., Virgil E. Herrick, and G. Lawrence,Rarick, Perception of Symbols in Skill Learning by Mentally Retarded, Gifted, and Normal Children. Project SAE 6436 and SAE 7135 U.S. Office of Education, Madison, Wisconsin: School of Education, University of Wisconsin, 1961.

68. Harris, Theodore L. and G. Lawrence, Rarick, "Problems of Pressure in Handwriting," Journal of Experimental Education Vol 28 (1959) p. 65-84.

69. Herrick, Virgil E., Comparison of Practices in Handwriting Advocated by 19 Commercial Systems of Handwriting Instruction. Committee on Research in Basic Skills, University of Wisconsin, Madison 1961

70. Herrick, Virgil E., "Handwriting and Children's Writing," Elementary English, Vol. 37 (1960) pp. 248-258

71. Herrick, Virgil E., Handwriting and Related Factors, 1800- 1960. Washington: The Handwriting Foundation, 1960

72. Herrick, Virgil E., "Handwriting Tools for Children," National Education Association, Vol 50 (1961) pp 49-50.

73. Herrick, Virgil E., "Manuscript and Cursive Writing," Childhood Education, Vol 37 (1961) pp 264-267)

74 Herrick, Virgil E., (ed.) New Horizons for Research in Handwriting. Madison: University of Wisconsin Press, 1963.

75. Herrick, Virgil E., and Adrienne Erlebacher, " The Evaluation of Legibility in Handwriting," in #74 above

76. Herrick, Virgil E. and Nora Okada, "The Present Scene: Practices in Teaching of Handwriting in the United States," in # 74 above.

77. Herrick, Virgil E. and Wayne Otto, "Pressure on Point and Barrel of a Writing Instrument," Journal of Experimental Education, Vol 30 (December, 1961) pp 215-230.

78. Hildreth, Gertrude, "Manuscript Writing After 60 Years," Elementary English, Vol 37 (January, 1960) pp. 3-13.

79. Hildreth, Gertrude, "Simplified Handwriting for Today,"Journal of Educational Research Vol 56, No.8 (February, 1963) pp. 330-333.

80. Hirsch, Edward and Fred C. Niedermeyer, "The Effects of Tracing Prompts and Discrimination Training on Kindergarten Handwriting Performance," Journal of Educational Research, Vol 67, No 2 (October, 1973) p. 81-86.

81. Horn, Thomas D., "Handwriting and Spelling," Review of Educational Research Vol 37 (1967) p. 168-177.

82. Horn, Thomas D., (ed.) Research on Handwriting and Spelling, Champaign, Illinois: National Council Teachers of English, 1966. (whole issue)

83. Horton, Lowell W. "Illegibilities in the Cursive Handwriting of Sixth - Graders," Elementary School Journal, Vol 70 (May, 1970) pp 446-450

84. Huitt, Ray. "Handwriting: The State of the Craft," Childhood Education, Vol 48 No 4 (January, 1972) pp. 219-223.

85. Hunnicutt, G.W. and W.J. Iverson (eds) Research in the Three R's. New York: Harper & Row, 1958.

86. Inglis, A and E.A. Gibson. The Teaching of Handwriting. Don Mills, Ontario: Thomas Nelson, 1964.

87. Irish, E.H. The Principles of Time and Motion Applied to The Teaching of Handwriting. Unpublished doctoral dissertation, Leland Standford University, 1948.

88. Johnson, W.T. The Johnson Handwriting Program. Cambridge, Mass.: Educators Publishing Service 1972

89. Keough, J.P. A Concise Method for Legible Printing. Sherbrooke, Quebec: 1946

90. King, Fred M. "Handwriting Practices in Our Schools Today." Elementary English Vol 38 (1961) pp. 483-486.

91. King, Fred M. "Improving the Handwriting Program," National Elementary Principal, Vol 38, No 5 (February, 1959) pp 16-18.

92. Kinney, Myles C. Teaching Handwriting - A Teacher's Guide to Developing Skills in Handwriting. Regina, Saskatchewan: School Aids and Text Book, 1964. 34 p.

93. Klein, S.P., and F.M. Hart, "Chance and Systematic Factors Affecting Essay Grades," Journal of Educational Measurement, Vol 5 (1968) p. 197-206.

94. Krzesni, Joseph S. "Effect of Different Writing Tools and Paper on Performance of the Third Grader," Elementary English, Vol 48, (November, 1971) pp. 821-824.

95. Lamb, Rose. Guiding Children's Language Learning . Dubuque, Iowa: Wm. C. Brown, 1971 p. 208.

96. Lebrun, Yvan and Piet Van de Craen, "Developing Writing Disorders and Their Prevention," Journal of Special Education, Vol 9 (Summer, 1975) p. 206.

97. Lewis, Edward R., "An Analysis of Children's Manuscript Handwriting," Dissertation Abstracts, Vol 25 No 3 (1964) pp. 1786-1787)

98. Lewis, Edward R. and Hilda P. Lewis, "Which Manuscript Letters are Hard for First Graders?" Elementary English Vol 41 (December, 1964) pp. 855-858.

99. Mackay, David and Brian Thompson and Pamela Schaub, Breakthrough to Literacy: Teacher's Manual: The Theory and Practice of teaching Initial Reading and Writing. London, England: Longman Group Ltd, for the Schools Council Programme in Linguistics and English Teaching, 1970. p. 49-55.

100. McNees, Margaret C. and Patrick N. McNees and Benjamin B. Lakey, "Modifying Cluttered Handwriting," Academic Therapy, Vol 7, No. 2 (Spring, 1972) pp. 293-295.

101. McElravy, Anna. "Handwriting and the Slow Learner," Elementary English, Vol 41, (1964) pp. 865-868.

102. Maclean, H.B. and G. Bollert. The Maclean Method of Writing. Vancouver, B.C.: W. J. Gage Ltd., 1966.

103. Mann, Philip H. and Patricia Suiter, Handbook of Diagnostic Teaching: A Learning Disabilities Approach. Abridged Edition. Boston: Allyn and Bacon, 1974. p. 133.

104. Marshall, Jon C., "Writing Neatness, Compositio Errors, and Essay Grades Re-examined," Journal of Educational Research, Vol 65, No5 (January, 1972) p. 213-215

105. Minkoff, Harvey. "Teaching the Transition from Print to Script Analytically," Elementary English, Vol 52, No. 2, (February, 1975) p. 203-204.

106. Monroe, W.S. (ed.) Encyclopedia of Educational Research New York: Macmillan, 1941.

107. Montessori, Maria. Pedagagie Scientifique: La Decouverte de l'Enfant. Paris, France: Desclée de Brouver, 1952. p. 158.

108. Mullins, John et al. "A Handwriting Model for Children with Learning Disabilities," Journal of Learning Disabilities, Vol 5 (May, 1972) pp 58-63.

109. National Elementary Principal. Vol 38, No 5 (February, 1959) whole issue.

110. Neuhoff, Howard T. Alphabet 68: New Basic Approach to Modern Handwriting for Grades Above Primary. Forest Hills, N.Y.: Numark Publications, 1968 68 p.

111. New Brunswick, Department of Education. The Primary Language Arts Programme, 1972 pp. 100-101.

112. New York City Board of Education. Teaching Handwriting Curriculum Bulletin No. 3 1960-61 series 42 p.

113. Newland, T. Ernest. "An Analytical Study of the Development of Illegibilities in Handwriting from the Lower Grades to Adulthood," Journal of Educational Research , Vol 26 (Dec. 1932) pp 249-258.

114. Niedermeyer, Fred C. "Kindergarteners Learn to Write," Elementary School Journal, Vol 74, No 3 (December, 1973) pp. 130-135.

115. Niemann, Ann Smith."Handwriting, Spelling and Creative Writing in the Primary Grades," Elementary English, Vol. 48, No. 8 (1971) pp. 963-969.

116. Noble,J. Kendrick."Handwriting Programs in Today's Schools," Elementary English, Vol. 40 (May, 1963. pp513-517.

117 Nova Scotia Department of Education. Manuscript and Cursive Writing in the Elementary School - A Teachers' Guide, 1971, 17pp.

118. Ontario Department of Education. Kindergarten , 1966 pp. 55-58.

119. Otto, Wayne, and Dan W. Anderson. "Handwriting" in Ebel, R.L. (ed) Encyclopedia of Educational Research. Fourth ed. New York: Macmillan, 1969, pp 570-579.

120. Otto, Wayne and K. Koenke, (eds), Remedial Teaching :Research and Comment Boston: Houghton Mifflin, 1969 pp 272-273.

121. Otto, Wayne and Richard A. McMenemy and Richard J.Smith. Corrective and Remedial Teaching 2nd ed. Boston: Houghton Mifflin, 1973 pp. 331-365

122. Otto, Wayne G. Lawrence Rarick, "Effect of Time of Transition from Manuscript to Cursive Writing upon Subsequent Performance in Handwriting, Spelling, and Reading," Journal of Educational Research, Vol. 62 (1969) pp. 211-216.

123. Otto, Wayne et al. "Evaluation of a Modified Grip in Handwriting," Perceptual and Motor Skills, Vol 22 (1966) p. 310.

124. Parres, Richard M., "The Body Midline as a Psycho-educational Variable Affecting the Handwriting Habits of Mentally Retarded Children," Dissertation Abstracts Vol 29, No. 10 (1969) pp. 3468-3469A.

125. Peel, County. (Ontario) Board of Education. Peel Primary Guide for Teachers pp. 26-31.

126. Peterson, Georgia L. "An Approach to Writing for Kindergarteners," Elementary English Vol 52 (January, 1975) pp. 89-91.

127. Petty, Walter T, "Handwriting and Spelling: Their Current Status in the Language Arts Curriculum," in Horne, Thomas A. see No. 82 above p. 1-8.

128. Plattor, Emma E. "The Development of a Programmed Course of Study in Manuscript and Cursive Writing for Use in Teacher Education," Dissertation Abstracts, Vol 27 No. 1 (1966) p. 131 A.

129. Plattor, Emma E. and Ellsworth S. Woestehoff. "Towards a Singular Style of Instruction in Handwriting," Elementary English Vol 48 (December, 1971) p1009-1011.

130. Polkinghorne, A.R. "Current Practices in Teaching Handwriting," Elementary School Journal Vol 47 (1946) p. 218-224.

131. Pressey, Sidney L., and Luella C. Pressey, "An Analysis of 3,000 Illegibilities in Handwriting of Children and Adults," Education Research Bulletin, Vol. 6 , (1927) pp. 270-273.

132. Primary Curriculum Guides Etobicoke, Ontario Board of Education, no date.

133. Quant, Leslie, "Factors Affecting the Legibility of Handwriting," Journal of Experimental Education, Vol 14 (June, 1946) pp. 297-316.

134. Quebec. Department of Education. Handwriting in the Language Arts Program-A Teacher's Guide. 1971 44 p.

135. Ramos, Randy, "Left-Handed Writing," in Arena, John I., (ed.) Building Handwriting Skills in Dyslexic Children. San Rafael, California: Academic Therapy Publications, 1970 pp. 83-84.

136. Reed, G.F. and A.C. Smith, "A Further Experimental Investigation of the Relative Speeds of Left and Right Handed Writers," Journal of Genetic Psychology, Vol 100 (1962) pp. 275-288.

137. Reynolds, Lloyd J. Italic Calligraphy and Handwriting Exercises and Text. New York: Pentalic Corporation, 1969 variously paged, 23 plates.

138. Richardson, M. Writing and Writing Patterns. London: University of London Press, 1972

139. Rondinella, Oreste R, "An Evaluation of Subjectivity of Elementary School Teachers in Grading Handwriting," Elementary English, Vol 40 (1963) pp. 531-532.

140. Saunders, Roger E., Angeline Gialas and Donald B. Hofler. Visual, Auditory, Kinesthetic, Tactile Skills to Writing, Reading and Spelling. Cambridge, Massachusetts: Educators Publishing Service, 1969. 3 volumes.

141. Scannell, D.P. and Jon C. Marshall, "The Effect of Selected Composition Errors on the Grades Assigned to Essay Examinations," American Educational Research Journal , Vol 3 (1966) pp. 125-130.

142. Schnell, Leo M. and Paul C. Burns, "Retention and Changes by College Students of Certain Upper-Case Cursive Letter Forms," Elementary English, Vol 40 (May, 1963) p. 513-517.

143. Seifert, Elvise P., "Personal Styles of Handwriting in Grades 6,7,8 and 9," Dissertation Abstracts, Vo 20, No. 9 (1960) pp. 358 1-82.

144. Shane, Harold G., and June G. Mulry. Improving Language Arts Instruction Through Research. Association for Supervision and Curriculum Development, National Education Association, Washington, D.C., 1963 pp. 45-60.

145. Silverberg, Norman E. and Margaret C. Silverberg interviewed by Diane Divoky (Item 27 above)

146. Smith, James A. Adventures in Communication: Language Arts Methods. Boston, Allyn and Bacon, 1972 pp. 389-411.

147. Smith, Lawrence J. "Handwriting and Child Development," National Elementary Principal, Vol 38, No. 5 (February, 1959) p. 13-14.

148. Smith, Robert E., Your Handwriting. Minneapolis, Minnesota: Control Data Corporation, 1971. 105 p.

149. Spalding, Romalda Bishop and Walter T. Spalding. The Writing Road to Reading: A Method of Phonics for Teaching Children to Read. 2nd rev. ed. New York: Wm. Morrow, 1969 pp. 45-75.

150. Stothers, C.E. and J.W. Trusler. A Basic Writing Course. Toronto: Gage, no date. 5 volumes of samples.

151. Strange, H.K. "When is Writing Good Enough? Scottish Educational Journal, (January, 1971) p. 23-24.

152. Strickland, Ruth G. The Language Arts in the Elementary School. Boston, Heath, 1957. Chapter 12, pp. 273-308.

153. Suen, Ching Y. "Handwriting Education - A Bibliography of Contemporary Publications." Visible Language, Vol. 9, No. 2 (Spring, 1975) pp 145-157.

154. Suen, Ching Y. "Handwriting Education in Canada." Saskatchewan Journal of Educational Research and Development, Vol. 5, No. 2, (Spring, 1975), pp. 46-52.

155. Tagatz, Glenn E. et al. "Effects of Three Methods of Instruction Upon the Handwriting Performance of Third and Fourth Graders," in Otto, Wayne and K. Koenke. (Item 120 above) pp. 234-239.

156. Tawney, S. "An Analysis of the Ball Point Pen Versus the Pencil as a Beginning Handwriting Instrument," Elementary English, Vol.44, (1967) pp. 59-61.

157. Templin, Elaine M. Research and Comment: Handwriting, the Neglected R. Elementary English, Vol. 37 (1960) p. 386-389.

158. Tenaglia, Richard. "Graphotherapy: Aiding Children's Personality Development," Elementary English Vol. 50, No. 5 (1973) pp. 775-788.

159. Thompson, A.D. It's Fun to Write Books 1 and 2. Toronto, Macmillan, 1954.

160. Toronto. Metropolitan Seperate School Board. Primary Department. Writing Manual For Primary Division 56 p.

161. Towle, Maxine and Allen Ginsberg. "An Educator's Mystery: Where Do Performance Problems Come From?" Journal of Learning Disabilities, Vol. 8, No. 8 (October, 1975) pp. 486-489.

162. Trembly, Dean "Should Your Child Write With The Left Hand?" in Arena, John I (Item 8. above) pp 107-113

163. Veal, R.C. and E. Davidson I Learn To Write Indiana: E.C. Seale, 1963.

164. Vukelich, Carol. "Language Arts In Early Childhood Education," Elementary English, Vol. 51, No. 2 (February, 1974) pp. 300-315.

165. Wedell, K. and I Edna Hane. "Some Aspects of Perceptual- Motor Disability in 5½ Year Old Children," British Journal of Educational Psychology, Vol. 39 (June, 1969) pp. 174-182.

166. Westbrooks, Linda K. "Prescription for Ailing Penmanship," Teacher (September, 1976) pp. 100-106.

167. Wiles, M.E., "Effect of Different Sizes of Tools on the Handwriting of Beginners," Elementary School Journal, Vol 43, (March, 1943) pp. 412-414.

168. Worthy, W. The 'Renaissance' Italic Handwriting Books. London: Chatto & Windus, 1954. 4 volumes.

169. Wright, Jone P. and Elizabeth G. Allen. "Ready to Write," Elementary School Journal Vol. 75, No. 7 (April, 1975) pp. 430-435.

170. York Township, Ontario. Board of Education. Writing - Kindergarten to Grade 8, 1962. 29 pp.